DOCUMENT RESUME

ED 274 847 CE 045 231

AUTHOR Grant, Shelia I.
INSTITUTION East Texas State Univ., Commerce. Occupational Curriculum Lab.
PUB DATE 86
NOTE 66p.; For related documents, see CE 045 228-232.
PUB TYPE Guides - Classroom Use - Materials (For Learner) (051)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Area; *Arithmetic; *Computation; Decimal Fractions; Fractions; Geometry; Learning Activities; *Machine Repairers; *Mathematics Skills; Measurement Techniques; *Mechanics (Process); Percentage; Problem Solving; Secondary Education; *Trade and Industrial Education; Volume (Mathematics)

ABSTRACT

This collection of learning activities is intended for use in reinforcing mathematics instruction as it relates to mechanical repair. Fifty activity sheets are provided. These are organized into units on the following topics: numeration, adding whole numbers, subtracting whole numbers, multiplying whole numbers, dividing whole numbers, factoring, fractions, decimals, percents, measurement, and time and pay. A variety of activities are provided including exercises in spelling numbers correctly, arithmetic exercises, word problems, and practice in working with geometric figures and interpreting charts. Vocabulary words taken from the area of mechanical repair are incorporated into the activities. Answers to each activity are also provided. (MN)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED274847

MATH LEARNING ACTIVITY PACKET

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

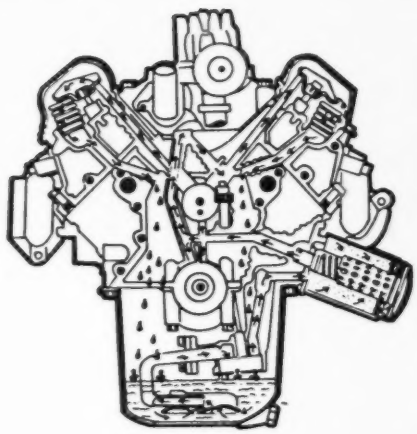
✓ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."



MECHANICAL REPAIR

Prepared by Shelia I. Grant

BEST COPY AVAILABLE

OCCUPATIONAL CURRICULUM LAB (L) EAST TEXAS STATE UNIVERSITY

CE045231

NOTE TO THE INSTRUCTOR

The following Learning Activity Sheets have been developed for Mechanical Repair. These Learning Activity Sheets relate directly to each unit of the Self-Contained Math Manual developed by the Occupational Curriculum Laboratory at East Texas State University.

Instructors are encouraged to use these activities to reinforce instruction in the area of math as it relates to the students' individual trade areas.

CONTENTS

Activity Sheet 1--SPELL IT RIGHT
Activity Sheet 2--ADDITION
Activity Sheet 3--ADDITION
Activity Sheet 4--SUBTRACTION
Activity Sheet 5--SUBTRACTION
Activity Sheet 6--MULTIPLICATION
Activity Sheet 7--MULTIPLICATION
Activity Sheet 8--DIVISION
Activity Sheet 9--DIVIDING
Activity Sheet 10--DIVIDING ITEMS
Activity Sheet 11--WORD PROBLEMS
Activity Sheet 12--FACTORS
Activity Sheet 13--DRAWING FRACTIONS
Activity Sheet 14--ADDING FRACTIONS
Activity Sheet 15--SUBTRACTING FRACTIONS
Activity Sheet 16--SUBTRACTING FRACTIONS
Activity Sheet 17--MULTIPLYING FRACTIONS
Activity Sheet 18--MULTIPLYING FRACTIONS
Activity Sheet 19--WORKING WITH FRACTIONS
Activity Sheet 20--DIVIDING FRACTIONS
Activity Sheet 21--USING FRACTIONS
Activity Sheet 22--WRITING DECIMALS
Activity Sheet 23--DECIMAL PROBLEMS
Activity Sheet 24--GREATER THAN/EQUAL
Activity Sheet 25--ADDING DECIMALS
Activity Sheet 26--ADDING DECIMALS
Activity Sheet 27--SUBTRACTING DECIMALS
Activity Sheet 28--MULTIPLYING DECIMALS
Activity Sheet 29--MULTIPLYING DECIMALS
Activity Sheet 30--DIVIDING DECIMALS
Activity Sheet 31--USING DECIMALS
Activity Sheet 32--DECIMALS TO FRACTIONS
Activity Sheet 33--FRACTIONS TO PERCENTS
Activity Sheet 34--FINDING PERCENTS
Activity Sheet 35--FINDING PERCENTS
Activity Sheet 36--PERCENTS TO DECIMALS
Activity Sheet 37--MEASURING
Activity Sheet 38--WHICH IS WHICH?
Activity Sheet 39--CHANGING MEASUREMENTS
Activity Sheet 40--WORKING WITH MEASUREMENTS
Activity Sheet 41--ANGLES
Activity Sheet 42--CUTTING SHAPES
Activity Sheet 43--CIRCLES
Activity Sheet 44--PERIMETERS
Activity Sheet 45--PERIMETERS
Activity Sheet 46--AREAS
Activity Sheet 47--AREAS
Activity Sheet 48--VOLUME
Activity Sheet 49--TEMPERATURE
Activity Sheet 50--TIME

LEARNING ACTIVITY SHEETS

ANSWERS

LEARNING ACTIVITY SHEET 1

Evaluated to the satisfaction of instructor.

LEARNING ACTIVITY SHEET 2

A.
1. 25 yds.
2. 31 spark plugs
3. 216 in.
4. 20 washers
5. 999 bolts
6. 33 yds.
7. $5,928
8. 81 gaskets
9. $94,770

B.
1. 25 spark plugs
2. 67 students
3. 19 cans of spray paint
4. 324 in. of gasket material
5. $44 to repair the engine

LEARNING ACTIVITY SHEET 3

1. 30 washers
2. 68 belts
3. 66 filters
4. 550 pounds
5. $1,013
6. 31 pounds
7. 44 spark plugs
8. 9 wiper blades
9. 75 quarts of oil
10. 9 carburetors

LEARNING ACTIVITY SHEET 4

A.
1. 67 yds.
2. 113 bolts
3. 669 in.
4. 13 nuts
5. 526 spokes
6. 5 yds.
7. $29,073
8. 25 wheels
9. $1,819
10. 372 in.

B.
1. 67 in.
2. 50 bicycle spokes
3. $19
4. 2,612 bolts
5. $855

LEARNING ACTIVITY SHEET 5

1. 214 bolts
2. 454 inches
3. $6,144
4. 64 washers
5. 27 nuts
6. 20 spark plugs
7. 5 pounds
8. 14 carburetors
9. 2 quarts
10. 18 oil filters

LEARNING ACTIVITY SHEET 6

1. 9
2. 14
3. 18
4. 16
5. 40
6. 30
7. 63
8. 36
9. 24
10. 48
11. 32
12. 81
13. 16
14. 12
15. 8
16. 45
17. 21
18. 72
19. 64
20. 42

LEARNING ACTIVITY SHEET 7

1. 51 washes
2. 128 pounds
3. 56 spark plugs
4. 84 air filters
5. 150 fuel filters
6. 120 hours
7. 42 spark plugs
8. 60 quarts of oil
9. 288 gaskets
10. 6 hours

LEARNING ACTIVITY SHEET 8

1. 15
2. 9
3. 11
4. 81
5. 93
6. 103
7. 11 R3
8. 31
9. 11 R4
10. 7 R3
11. 3 R5
12. 11 R1
13. 10 R3
14. 22
15. 12
16. 16 R2
17. 5
18. 32
19. 21

LEARNING ACTIVITY SHEET 9

1. 16 spark plugs
2. 5 students
3. 120 minutes = 2 hours
4. 4 cars
5. 13 manuals
6. 32 pounds
7. 18 spark plugs
8. 4 quarts of oil
9. 71 wiper blades
10. 8 pistons

LEARNING ACTIVITY SHEET 10

1. 71 remainder 2
2. $1.15
3. 66
4. 66 remainder 1
5. 72 remainder 7
6. 61 remainder 3
7. 8 remainder 1

LEARNING ACTIVITY SHEET 11

1. 2,700 parts
2. $.06 per copy
3. 795 students
4. 188 letters daily
5. 19 reams
6. 9,581 copies
7. $1,300 a year

LEARNING ACTIVITY SHEET 12

1. 1, 2
2. 1, 3
3. 1, 2, 4
4. 1, 5
5. 1, 2
6. 1, 5
7. 1, 2
8. 1, 3
9. 1, 7
10. 1, 2, 4
11. 1, 3, 9
12. 1, 2, 4, 8

LEARNING ACTIVITY SHEET 13

Evaluated to the satisfaction of instructor.

LEARNING ACTIVITY SHEET 14

1. $1\frac{1}{4}$ inches
2. $6\frac{1}{4}$ yards
3. $34\frac{3}{4}$ pounds
4. $29\frac{7}{8}$ inches
5. $5\frac{3}{4}$ quarts
6. $11\frac{5}{8}$ feet
7. $4\frac{1}{2}$ hours
8. $7\frac{1}{2}$ cases
9. $10\frac{5}{8}$ yards
10. $14\frac{1}{4}$ yards

LEARNING ACTIVITY SHEET 15

1. $\frac{5}{8}$ yd. of steel wire
2. $\frac{3}{8}$ in. of brass rod
3. $8\frac{1}{5}$ yds. of starting rope
4. $4\frac{8}{21}$ in. of scrap iron
5. $\frac{13}{24}$ yd. of masking tape
6. $14\frac{2}{9}$ in. of copper wire
7. $3\frac{1}{6}$ yd. of tow chain
8. $\frac{1}{4}$ in. of steel tube
9. $47\frac{1}{8}$ in. of gasoline hose
10. $1\frac{2}{3}$ yds. of reinforcing rod

LEARNING ACTIVITY SHEET 16

1. $6\frac{1}{2}$ yds. of nylon rope
2. $13\frac{1}{4}$ yd. of tow chain

3. $\frac{1}{4}$ in. crack

4. 6 $\frac{5}{8}$ in.

5. $\frac{7}{8}$ in. of crack in the metal can

6. 24 $\frac{1}{4}$ pounds

7. 8 $\frac{1}{3}$ quarts

8. $\frac{3}{4}$ gallon

9. 1,500 $\frac{1}{2}$ pounds

10. 1 $\frac{19}{40}$ yards

LEARNING ACTIVITY SHEET 17

A.
1. $\frac{1}{4}$ in.
2. $\frac{1}{8}$ in.
3. $\frac{5}{16}$ in.
4. $\frac{15}{64}$ in.
5. $\frac{3}{16}$ mi.
6. $\frac{6}{25}$ cm.
7. $\frac{1}{2}$ yd.
8. $\frac{7}{64}$ ft.
9. $\frac{3}{8}$ ft.
10. $\frac{5}{64}$ in.

B.
1. 10 $\frac{5}{9}$ yd.
2. 5 $\frac{1}{2}$ in.
3. 16 $\frac{15}{32}$ in.
4. 9 $\frac{1}{6}$ yd.
5. 13 $\frac{1}{5}$ cm.

LEARNING ACTIVITY SHEET 18

1. 33 quarts
2. 9 $\frac{1}{2}$ gallons
3. 3 $\frac{3}{4}$ yards
4. 44 $\frac{1}{4}$ feet
5. 31 $\frac{2}{3}$ pounds
6. 2 $\frac{1}{4}$ hours
7. 108 cans
8. 17 $\frac{1}{2}$ yards
9. 12 $\frac{1}{2}$ gallons
10. 5 $\frac{1}{4}$ hours

LEARNING ACTIVITY SHEET 19

1. 2 ft., 1 in.
2. 11 $\frac{3}{7}$ or 11 anchor bolts

3. 8 pieces of pipe

4. 8 $\frac{1}{8}$ feet apart

LEARNING ACTIVITY SHEET 20

1. 2 $\frac{3}{4}$ gallons
2. 5 $\frac{1}{3}$ quarts
3. 5 $\frac{7}{8}$ yards
4. $\frac{3}{16}$ inch
5. 1 $\frac{7}{12}$ feet
6. 12 $\frac{1}{4}$ feet
7. 2 $\frac{1}{2}$ hours
8. 2 $\frac{1}{2}$ gallons
9. 1 $\frac{3}{4}$ hours
10. 4 $\frac{1}{2}$ cases

LEARNING ACTIVITY SHEET 21

1. 8 $\frac{3}{4}$ gallons
2. 17 $\frac{1}{8}$ inches
3. 23 $\frac{1}{4}$ m.
4. 2 $\frac{1}{4}$ pounds
5. 4 $\frac{11}{12}$ cm.
6. 1 $\frac{1}{16}$ oz.
7. 8 $\frac{1}{4}$ feet
8. 25 $\frac{1}{2}$ oz.
9. 1 $\frac{3}{4}$ yards
10. 2 $\frac{3}{32}$ gallons

LEARNING ACTIVITY SHEET 22

A.
1. four tenths m.
2. seven tenths gal. of solvent
3. sixty-five hundredths yd. of sand
4. thirty-seven hundredths cm.
5. forty-two hundredths mm.
6. fifty-four hundredths ft. of pipe
7. one and twenty-five hundredths in.
8. two and seventy-five hundredths cm. of pipe
9. one and four hundred thirty-five thousandths oz. of penetrating oil
10. four and two hundred twenty-five thousandths of an in.

B.
1. .6 cm.
2. .75 in. diameter
3. .25 in.
4. 1.5 in. putty knife
5. .3 cm. recess
6. .375 in. steel rod
7. .9375 lbs. of grease
8. .45 liter of paint
9. .625 in. thick flat iron
10. .66 yd. of nylon rope

LEARNING ACTIVITY SHEET 23

1. .303'
2. .202"
3. .002" - .008" (Not less than .002", not more than .008")
4. .005" - .007" (Not less than .005", not more than .007")
5. .014" - .016" (Not less than .014", not more than .016")
6. .250"
7. .03125"
8. .625"
9. 1.0625"
10. .375"

LEARNING ACTIVITY SHEET 24

A.
1. 48.3
2. 4.03
3. 5.25
4. =
5. 11.132
6. 459.6
7. 32.5
8. 12.495
9. =
10. 8.20

B. .0252, .0525, .252, .255, .525, 5.025, 5.225, 5.25, 52.52, 525.5

LEARNING ACTIVITY SHEET 25

1. 1.1 gm. of bolts
2. 1.5 kg. of screws
3. 10.28 l. of solvent
4. 16.63 cm. of steel tubing
5. 13.02 mm. of rebar
6. 45.57 cm. of angle iron
7. 86.174 mm. of wire
8. 32.066 l. of anti-freeze
9. 165.988 sq. meters
10. 102.835 sq. decimeters

LEARNING ACTIVITY SHEET 26

1. $406.25
2. 4.00 inches
3. 0.062 cm.
4. 27.75 feet
5. 3.05 gallons
6. 9.9 cm.
7. 60.9 cm.
8. 16.25 cm.
9. 26.242 mm.
10. 5.8 cm.

LEARNING ACTIVITY SHEET 27

1. .2 m.
2. 16.6 cm.
3. 4.09 m.
4. 1.35 ounces
5. 1.25 gallons
6. 932.8 cm.
7. 33.25 yards
8. 27.48 cm.
9. 2.25 gallons
10. 197.5 feet

LEARNING ACTIVITY SHEET 28

A.
1. 38.70
2. 4.1215
3. 12.8405
4. 30.456
5. .02268
6. 0.06044
7. .3395
8. 324.576
9. 39.7308
10. 3902.25

B.
1. 42454.845

LEARNING ACTIVITY SHEET 29

1. 718.5 feet
2. 13 hours
3. 112.5 miles
4. 23.25 feet
5. 89 feet

LEARNING ACTIVITY SHEET 30

1. 21.25 miles
2. 1.5 feet
3. 8.556 cm.
4. 2.5833 feet
5. 217.575 cm.

LEARNING ACTIVITY SHEET 31

1. 13.5 cm.
2. 22.5 feet
3. 7.5 cm.
4. 7 feet
5. 1.5833 ounces

LEARNING ACTIVITY SHEET 32

1. $\frac{4}{10}$
2. $\frac{7}{10}$
3. $4\ \frac{5}{10}$
4. $8\ \frac{72}{100}$
5. $42\ \frac{78}{100}$
6. $6\ \frac{325}{1000}$
7. $15\ \frac{82}{100}$
8. $32\ \frac{64}{100}$
9. $60\ \frac{25}{100}$
10. $6\ \frac{84}{100}$
11. $4\ \frac{89}{100}$
12. $16\ \frac{675}{1000}$
13. $960\ \frac{3}{10}$
14. $4\ \frac{683}{1000}$
15. $5\ \frac{65}{100}$

LEARNING ACTIVITY SHEET 33

1. 50%
2. 25%
3. 66.6%
4. 37.5%
5. 6.25%
6. 18.75%
7. 62.5%
8. 87.50%
9. 70%
10. 90%
11. 83.3%
12. 33.3%

LEARNING ACTIVITY SHEET 34

A.
1. 3.2
2. 5
3. 43.2
4. 10
5. 2.38

B.
1. 42
2. 58
3. 64
4. 50
5. 40

C.
1. 220
2. 560
3. 320
4. 48
5. 290

LEARNING ACTIVITY SHEET 35

1. 5 feet
2. 600 pounds
3. 12 ounces
4. 2 yards
5. 487.5 feet
6. 50%
7. 25%
8. 20%
9. 75%
10. 50%

LEARNING ACTIVITY SHEET 36

1. .20
2. .75
3. 1.50
4. .15
5. .14
6. .03
7. .50
8. .17
9. .99
10. .25

LEARNING ACTIVITY SHEET 37

A.
1. Flexible Tape
2. Combination Square
3. Flexible Tape
4. Flexible Tape
5. Flexible Tape
6. Steel Tape

B. Evaluated to the satisfaction of instructor.

LEARNING ACTIVITY SHEET 38

	VOLUME	LENGTH	AREA	WEIGHT	TEMPERATURE
1.		42 in.			
2.	9 cu. yds.				
3.			1450		
4.		39 m.			
5.		82 cm.			
6.		72 yds.			
7.				50 lbs.	
8.			2540		
9.	12 cu. yds.				
10.		42 ft.			
11.		63 ft.			
12.					55° F.
13.	15 gals.				
14.					90° F.
15.	2 pts.				
16.				4 gm.	

LEARNING ACTIVITY SHEET 39

1. 3 $\frac{1}{2}$ yds.
2. 16 ft.
3. 2376 in.
4. 8 cm.
5. $\frac{1}{4}$ m.
6. 2 in.
7. 7 $\frac{1}{6}$ ft.
8. 2 m.
9. 12 in.
10. 612 in.
11. 4 $\frac{1}{3}$ yds.
12. 1014 in.
13. 16 yds.
14. 260 cm.
15. 20 cm.
16. 741 in.
17. 56 mm.
18. 576 in.
19. 17 $\frac{1}{2}$ yds.
20. 10 $\frac{1}{2}$ ft.

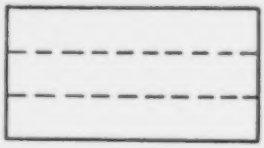
LEARNING ACTIVITY SHEET 40

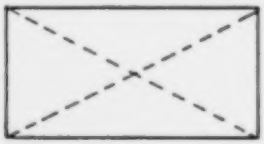
1. 12 lbs. 5 oz.
2. 18 lbs. 5 oz.
3. 14 tons 1,600 lbs.
4. 12 tons 600 lbs.
5. 16 lbs. 5 oz.
6. 11 lbs. 2 oz.
7. 2 lbs. 1 oz.
8. 22 lbs. 14 oz.
9. 6 lbs. 8 oz.
10. 16 tons 158 lbs.
11. 4 lbs. 1 oz.
12. 18 tons 400 lbs.

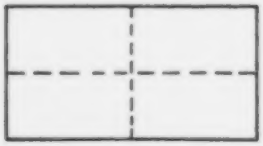
LEARNING ACTIVITY SHEET 41

Evaluated to the satisfaction of instructor.

LEARNING ACTIVITY SHEET 42

1. 

2. 

3. 

4.

LEARNING ACTIVITY SHEET 43

1. 12"
2. 14"
3. 8"
4. 7"
5. 21.98"

LEARNING ACTIVITY SHEET 44

1. 88 ft.
2. 18 ft.
3. a. 8 in.
   b. 10 in.
   c. 17 in.
4. 80 ft.

LEARNING ACTIVITY SHEET 45

A. 1. 140 ft.
   2. 40 ft.

B. 1. 52 ft.
   2. 72 in.

C. 1. 6.28 in.
   2. 12.56 ft.

LEARNING ACTIVITY SHEET 46

A. 1. 64 sq. ft.
   2. 36 m.

B. 1. kitchen - 100 sq. ft.
2. bath - 48 sq. ft.
3. 1st bedroom - 143 sq. ft.
4. 2nd bedroom - 168 sq. ft.
5. living room - 240 sq. ft.

Total = 699 sq. ft.

C. 16 sq. ft.

LEARNING ACTIVITY SHEET 47

1. 600 sq. ft.
2. 405 sq. ft.
3. 21 sq. ft.
4. 37.68 sq. in.
5. 15 sq. ft.

LEARNING ACTIVITY SHEET 48

1. volume = 84 ft.
2. volume = 160 in.
3. volume = 24 yds.
4. volume = 288 m.
5. volume = 125 yds.
6. volume = 12 ft.

LEARNING ACTIVITY SHEET 49

1. (a) 8^{o} C
(b) 60^{o} F
(c) 0^{o} C
(d) 104^{o} F
(e) 122^{o} F

2. (a) 212^{o} F
(b) 100^{o} C

3. (a) 32^{o} C
(b) 0^{o} F

4. 40^{o} C

LEARNING ACTIVITY SHEET 50

1. Alvarez, Victor - 39 $\frac{1}{2}$ hours
2. Tapia, Carlita - 39 $\frac{3}{4}$ hours
3. Coronado, Victor - 39 hours
4. Medina, Ruben - 39 $\frac{1}{4}$ hours
5. Garcia, Tony - 38 $\frac{1}{2}$ hours
6. Gomez, Juanita - 38 $\frac{3}{4}$ hours
7. James, Roberto - 37 $\frac{1}{4}$ hours

MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 1--SPELL IT RIGHT

UNIT I--NUMBERATION

Directions: Spell the following words correctly, both orally and in writing.

1. zero amount of battery acid
2. one can of oil additives
3. two spark plugs
4. three compressors
5. four generators
6. five gallons of acrylic enamel
7. six lacquers
8. seven varnishes
9. eight enamels
10. nine pistons
11. ten cylinders
12. eleven universal joints
13. twelve solvents
14. thirteen oxygen-acetylene welding torches
15. fourteen pipe wrenches
16. fifteen lug wrenches
17. sixteen hydraulic jacks
18. seventeen scissor jacks
19. eighteen bumper jacks
20. nineteen jack stands
21. twenty creepers
22. thirty rotary mowers
23. forty reel type mowers
24. fifty chain saws
25. sixty exhaust gas fans
26. seventy ceiling vent fans
27. eighty center punches
28. ninety drift punches
29. one hundred cold chisels
30. one thousand micrometers
31. one million thread gauges
32. one billion needle nose pliers
33. tenths of a pound
34. hundredths of an inch
35. thousandths of a yard of sheet metal
36. millionths of a foot
37. decimal point
38. comma
39. place value
40. face value
41. exponent

MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 2--ADDITION

UNIT II--ADDING WHOLE NUMBERS

Directions: Add and check your answers in the following problems.

Example: If 5 small engines are needed today and 3 small engines are needed next week, how many engines are needed in all?

$$\begin{array}{r} 5 \text{ engines} \\ +\ 3 \text{ engines} \\ \hline 8 \text{ engines} \end{array} \qquad \text{Check:} \quad \begin{array}{r} 3 \text{ engines} \\ +\ 5 \text{ engines} \\ \hline 8 \text{ engines} \end{array}$$

A. 1. 13 yds. of starting rope + 12 yds. of starting rope = ____

2. 22 spark plugs + 9 spark plugs = _____

3. 154 in. + 62 in. = _____

4. 5 washers + 3 washers + 12 washers = _____

5. 222 bolts + 594 bolts + 183 bolts = _____

6. 8 yds. + 7 yds. + 3 yds. + 15 yds. = _____

7. $38 + $252 + $5,638 = _____

8. 28 gaskets + 53 gaskets = _____

9. $52,383 + $2,395 + $39,034 + $958 = _____

B. 1. In a mechanical repair class, Juan cleaned 5 spark plugs the first day, 8 spark plugs the second day, and 12 the third day. How many spark plugs did he clean in all?

_____

2. Three mechanical repair classes contain 28, 21, and 18 students. How many students are in the three mechanical repair classes? _____

3. Susan needs 5 cans of white spray paint, 2 cans of black spray paint, and 12 cans of red spray paint. How many cans of spray paint does she need? _____

4. One mechanical repair class uses 156 inches of gasket material, one requires 115 inches, and one requires 53 inches. What is the total number of inches of gasket material used by the three classes? _____

5. Robert spent $24 on a cylinder, $6 on piston rings, $12 on a new piston, and $2 on gaskets. How much money did he spend to repair his engine? _____

MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 3--ADDITION

UNIT II--ADDING WHOLE NUMBERS

Directions: Read and work the following problems.

1. 17 washers
+ 13 washers

2. 43 bolts
+ 25 bolts

3. 37 filters
+ 29 filters

4. 398 pounds
+ 152 pounds

5. $938
+ 75

6. A tire had 22 pounds of air, 9 pounds of air was added. What is the air pressure of the tire? _____

7. A mechanic used 8 new spark plugs in the car being repaired; 36 spark plugs are left. How many spark plugs were there to start with? _____

8. The mechanic installed 2 windshield wiper blades, 6 spark plugs and 1 headlight. How many items were installed? _____

9. 27 quarts of oil were in stock. The new order contained 48 quarts. How many quarts of oil are on hand? _____

10. A student repaired 2 carburetors Monday, 3 carburetors Wednesday, and 4 carburetors Friday. How many carburetors did the student repair? _____

LEARNING ACTIVITY SHEET 4--SUBTRACTION

UNIT III--SUBTRACTING WHOLE NUMBERS

Directions: Subtract and check your answers on the following problems.

Example: If 19 yards of starting rope are used from a 53 yard spool, how many yards are left?

$$\begin{array}{r} 53 \text{ yds.} \\ -\ 19 \text{ yds.} \\ \hline 34 \text{ yds.} \end{array}$$

Check:

$$\begin{array}{r} 34 \text{ yds.} \\ +\ 19 \text{ yds.} \\ \hline 53 \text{ yds.} \end{array}$$

A.
1. 82 yds. - 15 yds. =
2. 136 bolts - 23 bolts =
3. 1,238 in. - 569 in. =
4. 26 nuts - 13 nuts =
5. 793 spokes - 267 spokes =
6. 23 yds. - 18 yds. =
7. $52,698 - $23,625 =
8. 53 wheels - 28 wheels =
9. $2,395 - $576 =
10. 594 in. - 222 in. =

B.
1. A piece of gasket material that is 56 inches long is cut from a piece that is 123 inches long. How much material is left? _____
2. How many bicycle spokes did Javier have left after he gave 26 of his 76 bicycle spokes to Tony? _____
3. Mrs. Brown bought a bicycle for $53 while Mr. Brown bought his on sale for $34. How much more did Mrs. Brown spend? _____
4. A carton holds 4,250 bolts. One of the schools needs 1,638. How many bolts are left in the carton? _____
5. The balance in the mechanical repair account is $1,176. What will be the new balance if they withdraw $321?

_____

MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 5--SUBTRACTION

UNIT III--SUBTRACTING WHOLE NUMBERS

Directions: Read and work the following problems.

1. 392 bolts
   - 178 bolts

2. 691 inches
   - 237 inches

3. $7,563
   - 1,419

4. 462 washers
   - 398 washers

5. 75 nuts
   - 48 nuts

6. A mechanic has 38 spark plugs. If they use 18 spark plugs today, how many will be left? _____

7. If a tire has 37 pounds of air pressure and you want it to have 32 pounds, how many pounds of air should you let out?
   _____

8. 19 carburetors need to be cleaned and repaired. If you cleaned and repaired 5 carburetors today, how many would be left to do? _____

9. You are changing oil in a car. The car requires 5 quarts of oil. If you have poured 3 quarts of oil into the engine, how many more quarts of oil will you need to add? _____

10. 24 oil filters were in the box. One class used 6 filters this week. How many oil filters are left in the box?
    _____

LEARNING ACTIVITY SHEET 6--MULTIPLICATION

UNIT IV--MULTIPLYING WHOLE NUMBERS

Directions: Find the product and check by reversing the order of factors.

1. 3 x 3 = _____ long nose pliers
2. 7 x 2 = _____ slip joint pliers
3. 6 x 3 = _____ offset pliers
4. 4 x 4 = _____ ball peen hammers
5. 8 x 5 = _____ cross peen hammers
6. 5 x 6 = _____ claw hammers
7. 9 x 7 = _____ sledge hammers
8. 4 x 9 = _____ standard tip screw drivers
9. 3 x 8 = _____ Phillips tip screw drivers
10. 6 x 8 = _____ offset screw drivers
11. 4 x 8 = _____ adjustable wrenches
12. 9 x 9 = _____ open-end wrenches
13. 2 x 8 = _____ combination wrenches
14. 3 x 4 = _____ box-end wrenches
15. 8 x 1 = _____ carburetor main jets
16. 9 x 5 = _____ flywheel magnets
17. 7 x 3 = _____ carburetor main adjustment needles
18. 9 x 8 = _____ idle-speed regulating screws
19. 8 x 8 = _____ breaker points
20. 7 x 6 = _____ breaker cams

MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 7--MULTIPLICATION

UNIT IV--MULTIPLYING WHOLE NUMBERS

Directions: Read and work the following problems.

1. 17 washers x 3 = _____

2. 32 pounds x 4 = _____

3. 8 spark plugs x 7 = _____

4. 14 air filters x 6 = _____

5. 25 fuel filters x 6 = _____

6. Three mechanics each worked 8 hours each day for 5 days. What was the total number of hours worked by the 3 mechanics. _____

7. A 6-cylinder vehicle requires 6 spark plugs. How many spark plugs would be required to change the spark plugs in 7, 6-cyliner cars? _____

8. If an engine requires 5 quarts of oil, how many quarts of oil would 12 such engines require? _____

9. One box contains 12 gaskets. There are 24 boxes in a case. How many gaskets are in one case? _____

10. If it takes a mechanic 2 hours to replace a starter, how long would it take that mechanic to replace 3 starters? _____

MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 8--DIVISION

UNIT V--DIVIDING WHOLE NUMBERS

Directions: Divide each of the following problems correctly. Check your answer by multiplying the quotient and divisor and adding the remainder.

Example:

$$\begin{array}{r} 14 \\ 6\overline{)84} \\ 6 \\ \hline 24 \\ 24 \\ \hline \end{array}$$

Check:

$$\begin{array}{r} 14 \\ \times\ 6 \\ \hline 84 \end{array}$$

1. $4\overline{)60}$ coils

2. $3\overline{)27}$ condensers

3. $4\overline{)44}$ spark plug wires

4. $8\overline{)648}$ tune-ups

5. $3\overline{)279}$ spark plugs

6. $9\overline{)927}$ cylinders

7. $6\overline{)69}$ pistons

8. $3\overline{)93}$ crankshafts

9. $8\overline{)92}$ connecting rods

10. $38 \div 5 =$ _____ valves

11. $32 \div 9 =$ _____ camshafts

12. $23 \div 2 =$ _____ carburetors

13. $63 \div 6 =$ _____ ignitions

14. $88 \div 4 =$ _____ valves

15. $7\overline{)84}$ valve lifters

16. $6\overline{)98}$ compression rings

17. $5\overline{)25}$ oil control rings

18. $3\overline{)96}$ piston pins

19. $84 \div 4 =$ _____ exhaust valves

LEARNING ACTIVITY SHEET 9--DIVIDING

UNIT V--DIVIDING WHOLE NUMBERS

Directions: Read and work the following problems.

1. Supplies were ordered for shop classes. The order contained a total of 48 spark plugs. If the order is divided among 3 classes, how many spark plugs will each class receive? _____

2. 5 lawn mowers are to be repaired. The class has 25 students If the class is divided equally, how many students will be assigned to work on each lawn mower? _____

3. If it took 30 minutes to replace one fan belt, how long should it take to replace 4 fan belts? _____

4. You have 24 quarts of oil. When changing oil in a vehicle you will need 5 quarts. Using these figures, how many cars can you service? _____

5. The shop instructor has ordered 39 motor repair manuals to be divided among 3 classes. How many motor repair manuals will each class receive? _____

6. 64 pounds ÷ 2 = _____

7. 90 spark plugs ÷ 5 = _____

8. 24 quarts of oil ÷ 6 = _____

9. 142 windshield wiper blades ÷ 2 = _____

10. 64 pistons ÷ 8 = _____

LEARNING ACTIVITY SHEET 10--DIVIDING ITEMS

UNIT V--DIVIDING WHOLE NUMBERS

Directions: Find the sum and divide by the number of numerical units.

1. Juan obtained the following measurements from several sheets of iron: 36, 54, 88, 91, and 88. Find the mean or average amount of sheets of iron.

2. Mario purchased intake valves at prices of $1.10, $1.22, $1.33, $1.15, and $.95. What was the mean price of the intake valves?

3. Sarah received compression measurements of 25, 92, 34, 94, and 85. Find the mean.

4. The temperatures of the rotary mower for 7 days were 60, 75, 43, 89, 71, 65, and 60. What was the mean temperature?

5. The dimensions of the front side of the ratchet box were 70, 80, 63, 97, 58, 62, 75, 75, and 73. Find the average dimension.

6. The lengths of the sheet metal were 60, 55, 83, 49, and 61. What was the average length of the sheet metal?

7. The cubic measurements of the inside portion of the automobiles were 7 yards, 8 yards, 6 yards, and 12 yards. What was the average in yards of the 4 automobiles?

MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 11--WORD PROBLEMS

UNIT V--DIVIDING WHOLE NUMBERS

Directions: Answer the following questions using either multiplication, subtraction, divisions, or addition.

1. A mechanic can count parts at an average speed of 60 parts per minute. How many parts can be counted in 45 minutes? _____

2. A garage wants to mail some letters to its customers. A roll of copy paper costs $24. How much will each copy cost if you get an average 400 copies per roll? _____

3. This year there are 345 seventh-graders and 450 eighth-graders. What is the total number of students? _____

4. A secretary typed the following letters: Monday - 200, Tuesday - 150, Wednesday - 175, Thursday - 210, and Friday - 205. What was the daily average? _____

5. How many reams of paper would you need if you used 9,500 sheets of paper? _____ (500 sheets of paper are in a ream.)

6. You reproduced the following copies: Monday - 7,555, Tuesday - 8,350, Wednesday - 10,500, Thursday - 12,550, and Friday - 8,950. What was your daily average? _____

7. How much can you save in 52 weeks (one year) if you saved $25 each week from your salary? _____

MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 12--FACTORS

UNIT VI--FACTORING

Directions: List the common factors of the following:

1. 2 and 6 torque wrenches
2. 3 and 12 electric impact wrenches
3. 4 and 12 wheel lug bolts
4. 5 and 15 tires
5. 2 and 14 acetic acid
6. 5 and 10 phosphoric acid
7. 6 and 10 sulfuric acid
8. 3 and 15 alternators
9. 7 and 21 voltage regulators
10. 8 and 12 clutches
11. 9 and 81 transmissions
12. 8 and 24 differentials

LEARNING ACTIVITY SHEET 13--DRAWING FACTIONS

UNIT VI--FRACTIONS

Directions: Draw a board and divide it into its fractional parts.

Example: $\frac{2}{8}$

1. $\frac{7}{8}$
2. $\frac{1}{2}$
3. $\frac{6}{7}$
4. $\frac{2}{3}$
5. $\frac{4}{5}$
6. $\frac{2}{5}$
7. $\frac{1}{8}$
8. $\frac{3}{8}$
9. $\frac{5}{12}$
10. $\frac{4}{7}$

MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 14--ADDING FRACTIONS

UNIT VI--FRACTIONS

Directions: Read and work the following problems.

1. $\frac{1}{2}$ inch + $\frac{3}{4}$ inch =
2. 3 $\frac{7}{8}$ yards + 2 $\frac{3}{8}$ yards =
3. 13 $\frac{1}{4}$ pounds + 21 $\frac{1}{2}$ pounds =
4. 27 $\frac{3}{4}$ inches + 2 $\frac{1}{8}$ inches =
5. 2 $\frac{1}{2}$ quarts + 3 $\frac{1}{4}$ quarts =
6. A supply order was received which contained $2\frac{1}{2}$ feet of rubber hose, 3 $\frac{7}{8}$ feet of rubber hose and 5 $\frac{1}{4}$ feet of rubber hose. How many feet of rubber hose were received in all? _____
7. It took 2 $\frac{1}{2}$ hours to repair the starter, $\frac{3}{4}$ hour to replace front brake shoes, and $1\frac{1}{4}$ hour to clean carburetor. What was the total time spent on the job? _____
8. A shop inventory was done; 4 $\frac{1}{2}$ cases of 10w30 oil were found, 2 $\frac{1}{2}$ cases of SAE 30, and $\frac{1}{2}$ case SAE 20. How many cases of oil were located? _____
9. You have 3 pieces of starting rope on hand. They measure 2 $\frac{1}{2}$ yards, 3 $\frac{7}{8}$ yards, and 4 $\frac{1}{4}$ yards. How many yards of starting rope do you have on hand? _____
10. You have two pieces of tow chain. One piece is 6 $\frac{3}{4}$ yards and the other 7 $\frac{1}{2}$ yards long. How many yards of tow chain do you have? _____

LEARNING ACTIVITY SHEET 15--SUBTRACTING FRACTIONS

UNIT VI--FRACTIONS

Directions: Subtract the following and reduce to lowest terms.

Example: $\frac{7}{8}$ yd. - $\frac{5}{8}$ yd.

$$\begin{array}{r} \frac{7}{8} \text{ yd.} \\ -\ \frac{5}{8} \text{ yd.} \\ \hline \frac{2}{8} \text{ yd.} = \frac{1}{4} \text{ yd.} \end{array}$$

1. $\frac{7}{8}$ yds. of steel wire - $\frac{2}{8}$ yds. of steel wire
2. $\frac{7}{16}$ in. of brass rod - $\frac{1}{16}$ in. of brass rod
3. 9 yds. of starting rope - $\frac{4}{5}$ yds. of starting rope
4. $9\ \frac{5}{7}$ in. of scrap iron - $5\ \frac{1}{3}$ in. of scrap iron
5. $\frac{11}{12}$ yds. of masking tape - $\frac{3}{8}$ yds. of masking tape
6. $17\ \frac{5}{9}$ in. of copper pipe - $3\ \frac{1}{3}$ in. of copper pipe
7. 8 yds. of tow chain - $4\ \frac{5}{6}$ yds. of tow chain
8. $\frac{5}{8}$ in. of steel tubing - $\frac{3}{8}$ in. of steel tubing
9. $83\ \frac{7}{8}$ in. of gasoline hose - $36\ \frac{3}{4}$ in. of gasoline hose
10. $6\ \frac{1}{3}$ yds. of reinforcing rod - $4\ \frac{2}{3}$ yds. of reinforcing rod

MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 16--SUBTRACTING FRACTIONS

UNIT VI--FRACTIONS

Directions: Read and work the following problems.

1. Juan ordered 8 $\frac{1}{4}$ yards of nylon rope for his shop. He used 1 $\frac{3}{4}$ yards on 2 lawn mowers. How much starting rope did he still have for the shop? _____

2. How much tow chain is left if Victor used 6 $\frac{3}{4}$ yards of a tow chain that is 20 yards long? _____

3. Ruben had a $\frac{7}{8}$ inch crack to weld on a metal can. How much crack was left to weld if he welded only $\frac{5}{8}$ inch and stopped? _____

4. Jimmie was welding some rods that were 59 $\frac{3}{4}$ inches long. Jerry was welding some rods that were 53 $\frac{1}{8}$ inches long. How much longer were Jimmie's rods? _____

5. Alfred was welding a crack in a metal can. The crack was $2\frac{3}{4}$ inches long. He welded 1 $\frac{7}{8}$ inches and had to stop welding because he burned his hand. How much of the crack in the metal can has not been welded? _____

6. 32 $\frac{1}{2}$ pounds - 8 $\frac{1}{4}$ pounds =

7. 14 $\frac{2}{3}$ quarts - 6 $\frac{1}{3}$ quarts =

8. 2 $\frac{1}{2}$ gallons - 1 $\frac{3}{4}$ gallons =

9. 2,400 $\frac{1}{2}$ pounds - 900 pounds =

10. 3 $\frac{7}{8}$ yards - 2 $\frac{2}{5}$ yards =

LEARNING ACTIVITY SHEET 17--MULTIPLYING FRACTIONS

UNIT VI--FRACTIONS

Directions: Multiply the following fractions and reduce answers to the lowest fractions.

A.
1. $\frac{1}{2}$ in. x $\frac{1}{2}$ =
2. $\frac{1}{4}$ in. x $\frac{1}{2}$ =
3. $\frac{5}{8}$ in. x $\frac{1}{2}$ =
4. $\frac{5}{8}$ in. x $\frac{3}{8}$ =
5. $\frac{2}{8}$ mile x $\frac{3}{4}$ =
6. $\frac{4}{10}$ cm. x $\frac{6}{10}$ =
7. $\frac{2}{3}$ yd. x $\frac{3}{4}$ =
8. $\frac{1}{8}$ ft. x $\frac{7}{8}$ =
9. $\frac{3}{4}$ ft. x $\frac{1}{2}$ =
10. $\frac{5}{16}$ in. x $\frac{1}{4}$ =

B. Multiply the following mixed numbers.

(NOTE: When multiplying a mixed number as $2\ \frac{1}{4}$, convert it to an improper fraction.)

1. $1\frac{2}{3}$ yd. x $6\ \frac{1}{3}$ =
2. $16\frac{1}{2}$ in. x $\frac{1}{4}$ =
3. $3\frac{7}{8}$ in. x $4\frac{1}{4}$ =
4. $2\frac{3}{4}$ yd. x $3\frac{1}{3}$ =
5. $5\frac{1}{2}$ x $2\frac{4}{10}$ =

LEARNING ACTIVITY SHEET 18--MULTIPLYING FRACTIONS

UNIT VI--FRACTIONS

Directions: Read and work the following problems.

1. $5\ \frac{1}{2}$ quarts x 6 =
2. $4\ \frac{3}{4}$ gallons x 2 =
3. $2\ \frac{1}{2}$ yards x $1\ \frac{1}{2}$ =
4. $14\ \frac{3}{4}$ feet x 3 =
5. $3\ \frac{1}{3}$ pounds x $9\ \frac{1}{2}$ =
6. If it takes $\frac{3}{4}$ hour to change oil in a car, how long should it take to change the oil in 3 cars? _____
7. 24 cans of brake fluid are in a case. If you have $4\ \frac{1}{2}$ cases, how many cans of brake fluid do you have? _____
8. You have 7 pieces of starter rope. Each piece is $2\ \frac{1}{2}$ yards long. How many yards of starter rope do you have? _____
9. $2\ \frac{1}{2}$ gallons of gas are in each gas can. If you have 5 gas cans, how many gallons of gas will you have? _____
10. If a lawn mower engine will run $1\ \frac{3}{4}$ hours on one tank of gas, how long will it run on 3 tanks of gas? _____

LEARNING ACTIVITY SHEET 19--WORKING WITH FRACTIONS

UNIT VI--FRACTIONS

Directions: Complete the following exercise.

1. A steel pipe is $8\frac{1}{3}$ feet long. It is necessary to divide it into four equal parts. How long is each part? _____

2. A mechanic is building a garage on a slab that has a perimeter of 40 feet. Anchor bolts are to be placed every $3\frac{1}{2}$ feet on the slab. How many anchor bolts will the mechanic need to buy? _____

3. A welder has 14 feet of pipe and he needs to cut it into $1\frac{3}{4}$ foot lengths. How many pieces of pipe that are $1\frac{3}{4}$ feet long can be cut? _____

4. A welder needs to put in two steel support posts spaced evenly in a room that is $16\frac{1}{4}$ feet long. How far apart should the welder put the steel support posts? _____

MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 20--DIVIDING FRACTIONS

UNIT VI--FRACTIONS

Directions: Read and work the following problems.

1. $5\ \frac{1}{2}$ gallons $\div$ 2 =
2. 24 quarts $\div$ $4\ \frac{1}{2}$ =
3. $17\ \frac{1}{3}$ yards $\div$ 3 =
4. $\frac{3}{8}$ inch $\div$ 2 =
5. $4\ \frac{3}{4}$ feet $\div$ 3 =
6. You have $24\ \frac{1}{2}$ feet of starter rope. If you cut it into 2 equal pieces, how long will each piece be? _____
7. If it takes $7\ \frac{1}{2}$ hours to replace the starter on 3 cars, how long will it take to replace the starter on 1 car? _____
8. You have $12\ \frac{1}{2}$ gallons of gas and 5 gas cans. If you put the same amount of gas in each gas can, how many gallons of gas will be in each one? _____
9. If a lawn mower engine will run $5\ \frac{1}{4}$ hours on 3 tanks of gas, how long will it run on one tank of gas? _____
10. 24 quarts of oil are in a case. If you have 108 quarts of oil, how many cases would you have? _____

MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 21--USING FRACTIONS

UNIT VI--FRACTIONS

Directions: Work the following problems.

1. $6\frac{1}{2}$ gallons + $2\frac{1}{4}$ gallons =
2. $9\frac{7}{8}$ inches + $7\frac{1}{4}$ inches =
3. $13\frac{3}{4}$ m. + $9\frac{1}{2}$ m. =
4. $7\frac{1}{2}$ pounds - $5\frac{1}{4}$ pounds =
5. $11\frac{2}{3}$ cm. - $6\frac{3}{8}$ cm. =
6. $1\frac{3}{16}$ oz. - $\frac{1}{8}$ oz. =
7. $2\frac{3}{4}$ feet x 3 =
8. $5\frac{2}{3}$ oz. x $4\frac{1}{2}$ oz. =
9. $3\frac{1}{2}$ yards ÷ 2 =
10. $8\frac{3}{8}$ gallons ÷ 4 =

MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 22--WRITING DECIMALS

UNIT VII--DECIMALS

Directions: Write the following decimals in word form.

Example: .5 = five tenths

A. 1. .4 meter _____

2. .7 gal. of solvent _____

3. .65 yds. of sand _____

4. .37 cm. _____

5. .42 mm. _____

6. .54 ft. of pipe _____

7. 1.25 in. _____

8. 2.75 cm. of pipe _____

9. 1.435 oz. of penetrating oil _____

10. 4.225 in. _____

B. Write the decimal form of the following fractions.

Example: $\frac{2}{5}$ = .4

1. $\frac{3}{5}$ cm. = _____

2. $\frac{3}{4}$ in. diameter = _____

3. $\frac{1}{4}$ in. = _____

4. $1\frac{1}{2}$ in. putty knife = _____

5. $\frac{3}{10}$ cm. recess = _____

6. $\frac{3}{8}$ in. steel rod = _____

7. $\frac{15}{16}$ lb. of grease = _____

8. $\frac{45}{100}$ l. of paint = _____

9. $\frac{5}{8}$ in.- thick flat iron bar = _____

10. $\frac{2}{3}$ yd. of nylon rope = _____

MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 23--DECIMAL PROBLEMS

UNIT VII--DECIMALS

Directions: Refer to the Briggs and Stratton Repair Instructions, pages 11 and 12, to find the common specifications. Write the correct specification on the provided blank in the following problems.

1. What is the spark plug gap for all models? _____

2. What is the contact point gap for all models? _____

3. What is the crankshaft end play for all models? _____

4. What is the intake valve clearance for a Model 92000 aluminum engine? _____

5. What is the exhaust valve clearance for a cast iron block Model 14 engine? _____

6. Write the decimal equivalent for a bolt that is $\frac{1}{4}$ inch in diameters. _____

7. Write the decimal equivalent for a spark plug point gap that is $\frac{1}{32}$ inch. _____

8. Write the decimal equivalent for a camshaft that is $\frac{5}{8}$ inch in diameter. _____

9. The main journal on a crankshaft is 1 $\frac{1}{16}$ inch in diameter. Write it as a whole number and a decimal together. _____

10. A valve stem measures $\frac{3}{8}$ inch in diameter. Write the correct decimal equivalent. _____

MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 24--GREATER THAN/EQUAL

UNIT VII--DECIMALS

Directions: Write in the provided blank, the greater of the two decimals. If they are equal, then put equal in the blank.

A. 1. 48.3 cm. or 4.83 cm. _____

2. 4.03 l. or 4.003 l. _____

3. 5.243 m. or 5.25 m. _____

4. 628.5 ft. or 628.500 ft. _____

5. 11.123 cm. or 11.132 cm. _____

6. 459.6 gm. or 459.55 gm. _____

7. 32.5 ft of steel pipe or 3.245 ft. of steel pipe _____

8. 12.45 m. of $\frac{3}{8}$ in. rod or 12.495 m. of $\frac{3}{8}$ in. rod _____

9. 4.5 lbs. or 4.50 lbs. _____

10. 8.02 oz. or 8.20 oz. _____

B. Place the following in order starting with the number with the least value.

5.25, 5.025, 52.52, 5.225, .525, .0525, .0252, 0.252, 525.5, and .255

_____ _____ _____ _____ _____

_____ _____ _____ _____ _____

LEARNING ACTIVITY SHEET 25--ADDING DECIMALS

UNIT VII--DECIMALS

Directions: Add the following decimals.

(NOTE: Always keep decimal points straight, or vertical, when adding or subtracting.)

1. .4 gm. bolts
   + .7 gm. bolts

2. .8 kg. of screws
   + .7 kg. of screws

3. 4.78 l. of solvent
   + 5.50 l. of solvent

4. 7.08 cm. of steel tubing
   + 9.55 cm. of steel tubing

5. 5.54 m. of rebar
   + 7.48 m. of rebar

6. 12.72 cm. of angle iron
   + 32.85 cm. of angle iron

7. 13.742 mm. of wire
   + 72.432 mm. of wire

8. 20.742 l. of antifreeze
   + 11.324 l. of antifreeze

9. 78.493 square meters of office space are in Francisco's shop. The shop area, excluding office, has 40,580 square meters. How many square meters are in the entire shop? _____

10. A formica top in a repair shop rest room has 87.495 square decimeters. The shop office desk formica top has 15.340 square decimeters. What is the total number of square decimeters in the two cabinet tops? _____

MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 26--ADDING DECIMALS

UNIT VII--DECIMALS

Directions: Work the following problems.

1. $275.50
   + 130.75

2. 2.75 inches
   + 1.25 inches

3. 0.037 cm.
   + 0.025 cm.

4. 19.5 feet
   + 8.25 feet

5. 2.75 gallons
   + .30 gallons

6. A mechanic used 5.65 m. of copper tubing on one job and 4.25 m. of copper tubing on another job. How much tubing was used? _____

7. An order was made for 24.65 cm. of gasoline line. A second order was made for 36.25 cm. of gasoline line. How much gasoline line was ordered? _____

8. The students in shop class used 4.5 cm., 3.75 cm., 2.25 cm., and 5.75 cm. of steel tubing. How much tubing was used?
   _____

9. There are 2 spools of wire. One spool contains 13.742 mm. of wire, the other 12.5 mm. of wire. How much wire is on hand?
   _____

10. Two mechanics are working on fuel systems. One used 2.3 cm. of copper tubing, the other used 3.5 cm. How many cm. of copper tubing was used? _____

LEARNING ACTIVITY SHEET 27--SUBTRACTING DECIMALS

UNIT VII--DECIMALS

Directions: Read and work the following problems.

1. .4 m. rebar
   - .2 m. rebar

2. 32.64 cm.
   - 16.04 cm.

3. 6.84 m.
   - 2.75 m.

4. 2.1 ounces
   - .75 ounces

5. 3.75 gallons
   - 2.5 gallons

6. A mechanic had 960.3 sq. cm. of gasket paper. He/she used 27.5 sq. cm. today. How much gasket paper is left? _____

7. An order was made for 57 yards of starter rope. The shipment contained 23.75 yards of starter rope. How many more yards of starter rope should be arriving? _____

8. It was estimated that 42.78 cm. of electrical wire will be needed this week. You have 15.3 cm. of electrical wire on hand. How much electrical wire should you order? _____

9. A gasoline can will hold 5 gallons of gas. It contains 2.75 gallons of gasoline. How much more gasoline will it hold? _____

10. The new spool of starter rope contained 250 feet of starter rope. The class used 52.5 feet of rope this week. How many feet of starter rope is left on the spool? _____

MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 28--MULTIPLYING DECIMALS

UNIT VII--DECIMALS

Directions: Multiply the following decimals.

(NOTE: When multiplying decimals, always add the number of decimal places in your problem and use the same numbers in your answer.)

Example:
$$\begin{array}{r} 4.32 \\ \times \quad .7 \\ \hline 3.024 \end{array}$$
This number has 2 decimal places.
This number has 1 decimal place.

A. 1. $4.5 \text{ cm.} \times 8.6$

2. $82.43 \text{ m.} \times .05$

3. $42.1 \text{ l.} \times .305$

4. $7.20 \text{ mm.} \times 4.23$

5. $.504 \text{ m.} \times .045$

6. $7.555 \text{ cm.} \times .008$

7. $.485 \text{ m.} \times .7 \text{ m.}$

8. $772.8 \text{ dm.} \times .42$

9. $4.52 \text{ km.} \times 8.79$

10. $82.5 \text{ cm.} \times 47.3$

LEARNING ACTIVITY SHEET 29--MULTIPLYING DECIMALS

UNIT VII--DECIMALS

Directions: Read and work the following problems.

1. If one spool of starter rope contained 239.5 feet of starter rope, how many feet of rope would 3 spools contain? _____

2. If it took 3.25 hours for a mechanic to service one vehicle. How long would it take that mechanic to service 4 vehicles?
_____

3. If a car will travel 22.5 miles on one gallon of gasoline, how far can it travel on 5 gallons of gasoline? _____

4. A mechanic has 3 pieces of copper tubing. Each piece measures 7.75 feet. How many feet of copper tubing does the mechanic have? _____

5. Each of the 4 shop classes used 22.25 feet of starter rope in class last week. How much starter rope was used? _____

MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 30--DIVIDING DECIMALS

UNIT VII--DECIMALS

Directions: Read and work the following problems. (Carry 4 places past the decimal if needed.)

1. If a car can travel 127.5 miles on 6 gallons of gasoline, how far can it travel on 1 gallon of gasoline? _____

2. If it takes 7.5 feet of starter rope to replace the starter ropes on 5 engines, how many feet of starter rope will it take to replace the starter rope on 1 engine? _____

3. Over a 5 day period 42.78 cm. of electrical wire was used. What was the average amount used each day? _____

4. Three students need a piece of fuel hose. One piece of hose is 7.75 feet long. If it is divided equally, how many feet of fuel hose will each student receive? _____

5. You have 870.3 sq. cm. of gasket paper. It must be divided and given to 4 classes. How many sq. cm. of gasket paper will each class receive? _____

LEARNING ACTIVITY SHEET 31--USING DECIMALS

UNIT VII--DECIMALS

Directions: Read and work the following problems. (Carry to 4 places past the decimal point if needed.)

1. Three mechanics were working with steel tubing. They used pieces measuring 3.75 cm., 5.25 cm., and 4.5 cm., respectively. How many cm. of steel tubing did they use? _____

2. The inventory shows part of 3 rolls of plastic fuel line. The rolls contain 2.75 feet, 12.5 feet, and 7.25 feet. How many feet of plastic fuel line do you have? _____

3. You will need 13.75 cm. of electrical wire for the project you are working on. You have 6.25 cm. of wire on hand. How many cm. of electrical wire will you need to finish the job? _____

4. You have figured that 1.75 feet of starter rope will be needed for the lawn mower you are working on. How many feet of starter rope will be needed to repair 4 lawn mowers? _____

5. One can of hand cleaner is in the shop. It contains 4.75 ounces of hand cleaner. If you divide this equally into 3 containers, how many ounces will be in each container?

_____

LEARNING ACTIVITY SHEET 32--DECIMALS TO FRACTIONS

UNIT VII--DECIMALS

Directions: Change the following decimal fractions to common fractions. (Do not reduce.)

1. .4 m. rebar _____
2. .7 m. of 1-in. pipe _____
3. 4.5 cm. of steel tubing _____
4. 8.72 cm.of oil hose _____
5. 42.78 cm. of electrical wire _____
6. 6.325 km. of $\frac{3}{14}$-in. plastic pipe _____
7. 15.82 cm. of $\frac{1}{8}$ in. x $\frac{3}{4}$ in. flat iron _____
8. 32.64 cm. of 1-in. steel pipe _____
9. 60.25 cm. of $\frac{1}{2}$ in. steel shaft _____
10. 6.84 m. of shop floor space _____
11. 4.89 sq. m. _____
12. 16.675 sq. m. _____
13. 960.3 sq. cm. of gasket paper _____
14. 4.683 cm. of gasoline hose _____
15. 5.65 m. of copper tubing _____

LEARNING ACTIVITY SHEET 33--FRACTIONS TO PERCENTS

UNIT VIII--PERCENTS

Directions: Change the following fractions to a percent.

1. $\frac{1}{2}$ = _____%
2. $\frac{1}{4}$ = _____%
3. $\frac{2}{3}$ = _____%
4. $\frac{3}{8}$ = _____%
5. $\frac{1}{16}$ = _____%
6. $\frac{3}{16}$ = _____%
7. $\frac{5}{8}$ = _____%
8. $\frac{7}{8}$ = _____%
9. $\frac{7}{10}$ = _____%
10. $\frac{9}{10}$ = _____%
11. $\frac{5}{6}$ = _____%
12. $\frac{1}{3}$ = _____%

LEARNING ACTIVITY SHEET 34--FINDING PERCENTS

UNIT VIII--PERCENTS

Directions: Multiply the following to find the percents.

(NOTE: % means part of 100. $\frac{20}{100} = .20 = 20\%$.)

Example: 3% of 90 = 90 x 3% = 2.70 NOTE: Always put decimals two places from right when writing percent.

A. 1. 4% of 80 bolts = _____

2. 10% of 50 ft. of wire = _____

3. 80% of 54 cu. ft. of shop storage space = _____

4. 25% of 40 washers = _____

5. 7% of 34 ft. of pipe = _____

B. Find the following percent.

Example: _____% of 100 = 30. Divide 100 into 30 and that will give the % needed for the answer.

1. _____% of 100 ft. of pipe = 42

2. _____% of 38 in. of copper tubing = 22

3. _____% of 75 lbs. of welding rods = 48

4. _____% of 32 screws = 16

5. _____% of 50 sq. ft. = 20

C. Fill in the blank in the following problems.

Example: 5% of _____ = 50. Divide 5 into 100, $5\overline{)100}$ (20) then multiply your answer (20) times 50. (50 x 20 = 1000).

1. 10% of _____ = 22

2. 5% of _____ = 28

3. 25% of _____ = 80

4. 50% of _____ = 24

5. 20% of _____ = 58

LEARNING ACTIVITY SHEET 35--FINDING PERCENTS

UNIT VIII--PERCENTS

Directions: Work the following percent problems.

(NOTE: % means part of 100. $\frac{20}{100} = .20 = 20\%$.)

1. 5% of 100 feet = _____
2. 30% of 2,000 pounds = _____
3. 75% of 16 ounces = _____
4. 80% of 2.5 yards = _____
5. 150% of 325 feet = _____

Find the following percent.

6. _____% of 100 pounds = 50
7. _____% of 32 ounces = 8
8. _____% of 75 feet = 15
9. _____% of 2,000 = 1500
10. _____% of 150 cm. = 75

LEARNING ACTIVITY SHEET 36--PERCENTS TO DECIMALS

UNIT VIII--PERCENTS

Directions: Change the following percents to decimals.

1. 20% = _____
2. 75% = _____
3. 150% = _____
4. 15% = _____
5. 14% = _____
6. 3% = _____
7. 50% = _____
8. 17% = _____
9. 99% = _____
10. 25% = _____

LEARNING ACTIVITY SHEET 37--MEASURING

UNIT IX--MEASUREMENT

Directions: Choose the correct measuring device for each of the following problems.

Fill in the blanks, selecting one of these measuring devices.

FLEXIBLE TAPE	STEEL TAPE
COMBINATION SQUARE	MICROMETER

A. 1. What measuring device would you use to measure the length of each side of a steel storage cabinet? _____

2. What device would you use to check the end of a steel pipe for being square? _____

3. What device would you use to measure the length of a piece of steel pipe? _____

4. What device would you use to lay out the rods for a window guard before you weld them? _____

5. What device would you use to measure the size of a shop office for installing carpet? _____

6. Which measuring device would you use to square the foundation lines for a shop floor? _____

B. 1. What is the length of your notebook? _____ inches; _____ centimeters.

2. What is the weight of your math book? _____ lbs.; _____ grams.

3. What is the height of your desk? _____ in.; _____ cm.

4. What is the length of the chalkboard in your room? Give your answer in meters.

LEARNING ACTIVITY SHEET 38--WHICH IS WHICH?

UNIT IX--MEASUREMENT

Directions: Put each of the following measures into the right category.

1. 42 in.
2. 9 cu. yds. of storage space
3. 1450 sq. ft.
4. 39 m.
5. 82 cm.
6. 72 yds.
7. 50 lbs. of iron plate
8. 2540 sq. ft.
9. 12 cu. yds. of sand
10. 42 ft. of wire
11. 63 ft. of pipe
12. 55° F.
13. 15 gals. of solvent
14. 90° F.
15. 2 pts. of brake fluid
16. 4 gm. of epoxy cement

	VOLUME	LENGTH	AREA	WEIGHT	TEMPERATURE
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					

LEARNING ACTIVITY SHEET 39--CHANGING MEASUREMENTS

UNIT IX--MEASUREMENT

Directions: Convert each of the following measurements. (To change to a larger unit--divide. To change to a smaller unit--multiply.)

MEASURES TO USE

	(approximately)
3 ft. = 1 yds.	39 in. = 1 m.
12 in. = 1 ft.	$\frac{2}{5}$ in. = 1 cm.
36 in. = 1 yd.	1 meter = 1000 mm.
	1 meter = 100 cm.
	1 cm. = 10 mm.

1. 126 in. = _____ yds.
2. 192 in. = _____ ft.
3. 66 yds. = _____ in.
4. 80 mm. = _____ cm.
5. 25 cm. = _____ m.
6. 5 cm. = _____ in.
7. 86 in. = _____ ft.
8. 78 in. = _____ m.
9. 30 cm. = _____ in.
10. 17 yds. = _____ in.
11. 156 in. = _____ yds.
12. 26 m. = _____ in.
13. 48 ft. = _____ yds.
14. 2.6 m. = _____ cm.
15. 8 in. = _____ cm.
16. 19 m. = _____ in.
17. 5.6 cm. = _____ mm.
18. 16 yds. = _____ in.
19. 52 ft. = _____ yds.
20. 126 in. = _____ ft.

LEARNING ACTIVITY SHEET 40--WORKING WITH MEASUREMENTS

UNIT IX--MEASUREMENT

Directions: Add and simplify the following problems.

1. 8 lbs. 3 oz.
   + 4 lbs. 2 oz.

2. 12 lbs. 3 oz.
   + 6 lbs. 2 oz.

3. 8 tons 300 lbs.
   2 tons 400 lbs.
   + 4 tons 900 lbs.

4. 5 tons 1800 lbs.
   500 lbs.
   + 6 tons 300 lbs.

5. 3 lbs. 5 oz.
   4 lbs. 7 oz.
   + 8 lbs. 9 oz.

6. 11 oz.
   4 lbs. 15 oz.
   + 5 lbs. 8 oz.

7. 6 lbs. 9 oz.
   - 4 lbs. 8 oz.

8. 31 lbs. 3 oz.
   - 8 lbs. 5 oz.

9. 10 lbs. 13 oz.
   - 4 lbs. 5 oz.

10. 32 tons 503 lbs.
    -16 tons 345 lbs.

11. 7 lbs. 8 oz.
    - 3 lbs. 7 oz.

12. 28 tons 800 lbs.
    -10 tons 400 lbs.

LEARNING ACTIVITY SHEET 41--ANGLES

UNIT IX--MEASUREMENT

Directions: Draw angles for the following sizes. You should be correct to within 2^{o}.

1. 80^{o}
2. 50^{o}
3. 45^{o}
4. 35^{o}
5. 21^{o}
6. 10^{o}
7. 19^{o}
8. 120^{o}
9. 55^{o}
10. 130^{o}
11. 90^{o}
12. 180^{o}
13. 175^{o}

MECHANICAL REPAIR

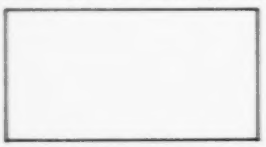
LEARNING ACTIVITY SHEET 42--CUTTING SHAPES

UNIT IX--MEASUREMENT

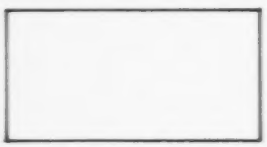
Directions: Perform the following activities.

1. Cut this sheet of metal into three pieces using parallel lines.

2. Cut this piece of gasket material into four pieces using intersecting lines that are not perpendicular.



3. Cut this piece of scrap iron into four pieces using perpendicular lines.



4. Cut this triangle board into two smaller triangular pieces which have right angles.

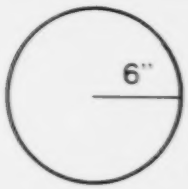
LEARNING ACTIVITY SHEET 43--CIRCLES

UNIT IX--MEASUREMENT

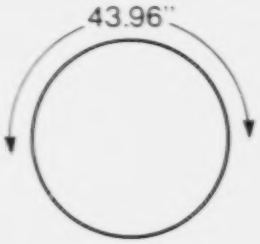
Directions: Read and work the following problems.

Find the diameter of the circles below.

1. _____

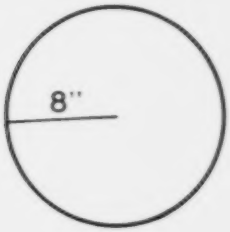


2. _____

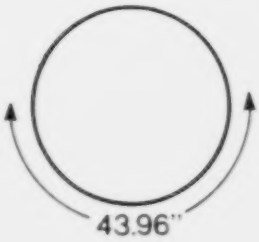


Find the radius of the circles below.

3. _____

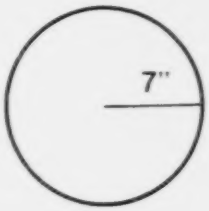


4. _____



Find the circumference of the circle below.

5. _____



MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 44--PERIMETERS

UNIT IX--MEASUREMENT

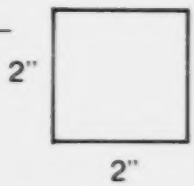
Directions: Find the following perimeters.

1. The shop you are working in measures 24 feet long and 20 feet wide. What is the perimeter of the shop? _____

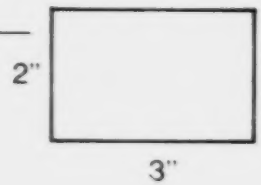
2. What is the perimeter of a work bench measuring 6 feet long and 3 feet wide? _____

3. Find the perimeter of the following shapes.

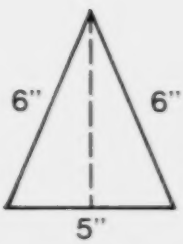
A. _____



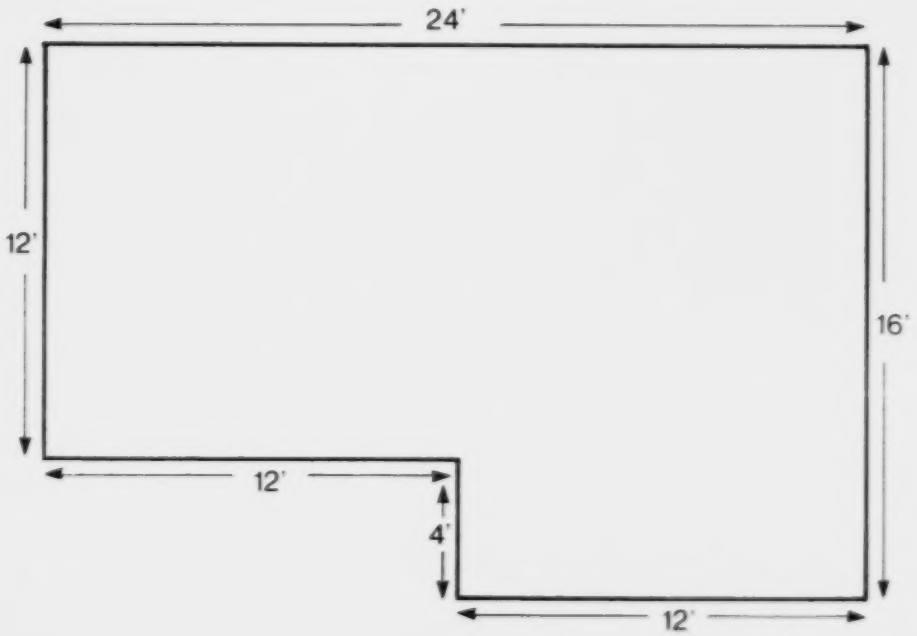
B. _____



C. _____



4. What is the perimeter of the shop shown below? _____



LEARNING ACTIVITY SHEET 45--PERIMETERS

UNIT IX--MEASUREMENT

Directions: Find the perimeter of the following. (Perimeter is the total of the sides.)

What is the perimeter of the following squares? The formula is $P = 4S$.

A. 1. How many feet of metal pipe will it take to go around a building if it is 35 feet on each side? _____

2. What is the perimeter of a work shop that is a square 10 feet on each side? _____

B. What is the perimeter of the rectangles in the following problems? The formula is $P = 2 (L + W)$.

1. How many feet of baseboard would it take for a room that is 14 feet by 12 feet? _____

2. How many inches would it be around a picture frame that is 16 inches by 20 inches? _____

C. Find the circumference of the following circles. $c = \pi d$, ($\pi = 3.14$, d = diameter.)

1. What is the circumference of a 2-inch water pipe? _____

2. What is the distance around a table that is 4 feet in diameter? _____

MECHANICAL REPAIR

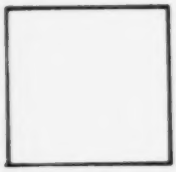
LEARNING ACTIVITY SHEET 46--AREAS

UNIT IX--MEASUREMENT

Directions: Find the area of the following.

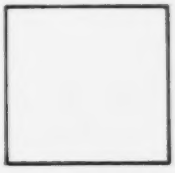
[NOTE: To find the area of a square, the formula is $A = s^2$ or s x s (side x side).]

A. 1.



8 ft.

2.



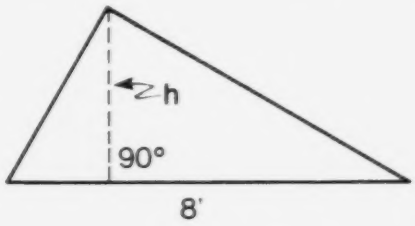
6 meters

B. Find the area of the rooms (or rectangles) in the following problem. The formula for finding area of a rectangle is a = l x w (area = length x width)

How many square feet are in a house if the kitchen is 10 feet long and 10 feet wide, the bathroom is 8 feet long and 6 feet wide, one bedroom is 13 feet long and 11 feet wide, the second bedroom is 14 feet long and 12 feet wide, and the living room is 16 feet long and 15 feet wide?

C. Find the area of the following triangle. The formula for finding the area of a triangle is $\frac{1}{2}$ (base x height).

h = 4'



LEARNING ACTIVITY SHEET 47--AREAS

UNIT IX--MEASUREMENT

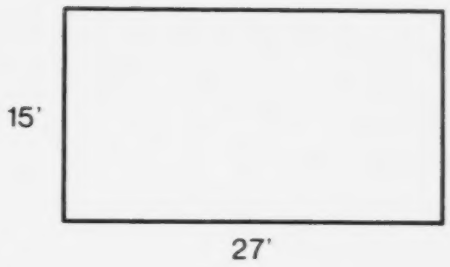
Directions: Find the area in the following problems.

1. The shop you are planning to build measures 30 feet long and 20 feet wide. What will the floor area be in square feet?

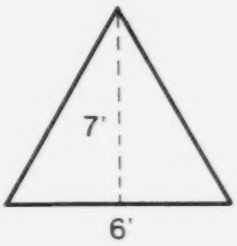
   _____

Find the area of the shapes below using measures given.

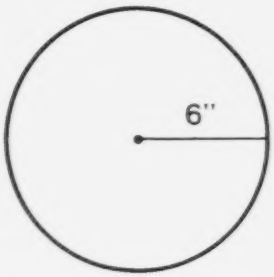
2. _____



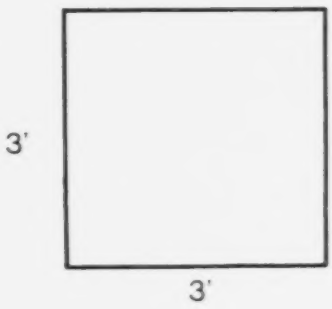
3. _____



4. _____



5. _____



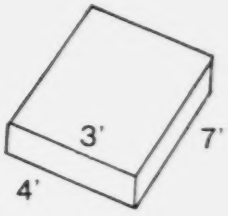
MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 48--VOLUME

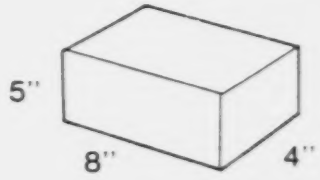
UNIT IX--MEASUREMENT

Directions: Use the formula V = lwh (Volume = length x width x height) to calculate the following problems.

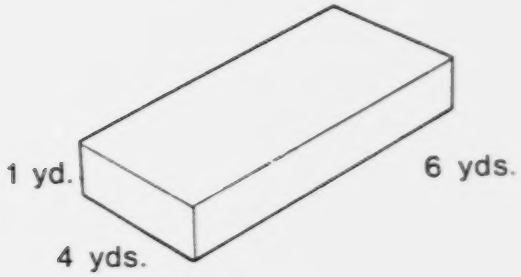
1.



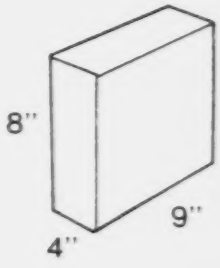
2.



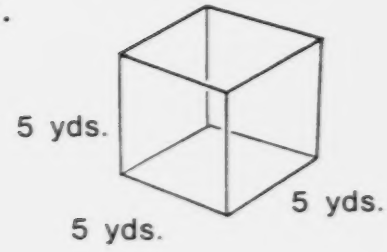
3.



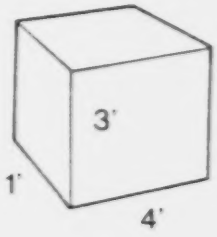
4.



5.



6.



LEARNING ACTIVITY SHEET 49--TEMPERATURE

UNIT IX--MEASUREMENT

Directions: Use the thermometer scale on the following page to answer the questions below.

1. (a) 45 degrees F = _____ C

   (b) 16 degrees C = _____ F

   (c) 32 degrees F = _____ C

   (d) 60 degrees C = _____ F

   (e) 50 degrees C = _____ F

2. What is the boiling point for (a) Fahrenheit? _____
   (b) Centigrade? _____

3. What is the freezing point for (a) Fahrenheit? _____
   (b) Centigrade? _____

4. What is the temperature if it is 90 degrees C and the temperature drops 50 degrees? _____

MECHANICAL REPAIR

LEARNING ACTIVITY SHEET 50--TIME

UNIT X--TIME AND PAY

Directions: Find the total hours each employee has worked.

EMPLOYEE	M	T	W	TH	F	S	TOTAL HOURS
Alvarez, Victor	$7\frac{3}{4}$	8	$7\frac{1}{2}$	$8\frac{1}{4}$	$7\frac{3}{4}$		
Tapia, Carlita	8	$7\frac{3}{4}$	$8\frac{1}{4}$		8	$7\frac{3}{4}$	
Coronado, Victor	$7\frac{3}{4}$	$7\frac{1}{2}$	8	$7\frac{3}{4}$		8	
Martin, Ruby	8		8	$7\frac{3}{4}$	8	$7\frac{1}{2}$	
Garcia, Tony	$7\frac{1}{2}$	8		8	$7\frac{3}{4}$	8	
Gomez, Juanita		8	$7\frac{1}{2}$	$7\frac{3}{4}$	$7\frac{3}{4}$	$7\frac{3}{4}$	
James, Roberta	$7\frac{1}{2}$	$7\frac{3}{4}$	8	8	6		